CLAIMS:

1. (Currently Amended) A method for synchronizing internal clocks of a first pair of first and second receiving stations A and B of a system, comprising the steps of:

transmitting a series of reference data packets from a beacon at a known position proximate to a geographical center point of a first pair of first and second receiving stations A and B;

assuming that the beacon is at the geographical center point;

~~comparing~~ correlating ~~a~~ first arrival times t_A and ~~a~~ second arrival times t_A, by plotting times t_A and t_B against each other for the series of reference data packets, ~~to determine a correlated arrival time data, the~~ a first arrival time t_A being a time of reception of ~~the~~ a particular reference data packet by ~~a first~~ receiving station A, ~~the~~ a corresponding second arrival time t_B being a time of reception of the particular reference data packet by ~~a second~~ receiving station B;

computing a linear polynomial fit $t_B = m\, t_A + b$, where slope m is function of the difference in the frequencies of the internal clocks of the receiving stations A and B and y-intercept b is the offset due to different start times of the internal clocks of the receiving stations A and B;

determining a bias for the internal clocks using known difference in distance between the beacon and the receiving stations A and B,

synchronizing the internal clocks of the receiving stations A and B according to the slope m, the offset b and the bias.

~~as function~~ ~~the of the correlated arrival time data and the first and second arrival times; and synchronizing the first and second arrival times of the reference data packet at the first and second receiving stations as a function of the linear polynomial fit~~.

2. (cancelled)

3. (Currently amended) The method according to ~~claim 2~~ claim 1, further comprising ~~the step of:~~ repeating the ~~comparing~~ correlating and computing steps for third and fourth receiving stations to determine a further slope, a further y-intercept and a further bias for the third and fourth receiving stations.

4. (Currently Amended) The method according to ~~claim 2~~ claim 3, further comprising ~~the step of:~~ repeating the ~~comparing~~ correlating and computing steps for a third receiving station in conjunction with the first receiving station A to determine a further slope, a further y-intercept and a further bias for the first and third receiving stations.

5. (Currently Amended) The method according to ~~claim 3~~ claim 4, further comprising the step of: correcting an arrival time difference between the first and second receiving stations and the third and fourth receiving stations as a function of an arrival time of a first data packet sent by a mobile device and a slope, a y-intercept and a bias computed for first and second pairs of the receiving stations, each of the first and second pairs including any two stations of the first, second, third and fourth receiving stations, the first pair including at least one receiving station which is not included in the second pair.

6. (Currently Amended) The method according to ~~claim 2~~ claim 1, further comprising the step of: repeating the transmitting, comparing and computing steps to update synchronization of the internal clocks of the receiving stations at a predetermined rate.

7. (Currently Amended) A method for determining a location of a mobile device, comprising the steps of:

synchronizing internal clocks of receiving stations according to the method of claim 1;

receiving a data packet from the mobile device by first and second receiving stations of the receiving stations;

determining a synchronized arrival time of the data packet at the first and second receiving stations;

calculating an arrival time difference between the first and second receiving stations; and computing the location of the mobile device, using a hyperbolic trilateration, as a function of the synchronized arrival time.

8. (Original) The method according to claim 7, further comprising the step of: determining a corresponding synchronized arrival time for at least first and second pairs of the receiving stations, each of the first and second pairs including any two of the first receiving station, the second receiving station, a third receiving station and a fourth receiving station, the first pair including at least one receiving station which is not included in the second pair.

9. (Original) The method according to claim 7, further comprising the step of: determining a

corresponding synchronized arrival time for at least first, second and third pairs of the receiving stations, the first, second and third pairs of the receiving stations including any two of the first receiving station, the second receiving station, the third receiving station, the fourth receiving station, a fifth receiving station and a sixth receiving station, the first pair including at least one receiving station which is not included in the second and third pairs, the second pair including at least one receiving station which is not included in the third pair.

10. (Original) The method according to claim 7, wherein the synchronizing step includes the sub steps: transmitting a reference data packet from a beacon at a known position; comparing a first arrival time and a second arrival time to determine a correlated arrival time data, the first arrival time being a time of reception of the reference data packet at the first receiving station, the second arrival time being a time of reception of the reference data packet by the second receiving station; computing a linear polynomial fit as a function of the correlated arrival time data and the first and second arrival times; and synchronizing arrival time of the reference data packet at the first and second receiving stations as a function of the linear polynomial fit.

11. (Currently Amended) A system for synchronizing internal clocks of a mobile device locating network, comprising:

receiving stations having the internal clocks;

a processor connected to the receiving stations;

and a beacon adapted for transmitting to the receiving stations a <u>series of</u> reference data packet<u>s</u>, the beacon having a known location<u> proximate to a geographical center point of the receiving stations</u>,

wherein each of the receiving stations is adapted to forward arrival times of the series of reference data packets to the processor, ~~and~~ wherein the processor is adapted to compute:

a linear polynomial fit $t_B = m\, t_A + b$ for a pair of receiving stations A and B, where t_A and t_B are the reception times of the series of reference data packets at receiving stations A and B, respectively, where slope m is function of the difference in the frequencies of the internal clocks of the receiving stations A and B, and where y-intercept b is the offset due to different start times of the internal clocks of the receiving stations A and B; and

a bias for the internal clocks of receiving stations A and B using known difference in distance between the beacon and the receiving stations A and B; and

wherein the processor is further adapted to synchronize the internal clocks of the receiving stations A and B according to the slope m, the offset b and the bias.

~~a linear polynomial fit of the arrival times to synchronize a time of arrival of data packets received from a mobile device.~~

12. (Original) The system according to claim 11, wherein the receiving stations includes are divided in pairs and wherein at least two pairs are used to locate the mobile device.

13. (Original) The system according to claim 11, wherein the processor receives first and second arrival times, the first arrival time being a time of reception of the reference data packet by a first receiving station of the receiving stations, the second arrival time being a time of reception of the reference data packet by a second receiving station of the receiving stations,

wherein the processor comparing the first arrival time against the second arrival time to determine a correlated arrival time data, wherein the processor computes a slope and a y-intercept as a function of the correlated arrival time data and the first and second arrival times, assuming equal distances between the beacon and the first and second receiving stations, and wherein the processor computes a bias of the correlated arrival time data from known distance differences between the beacon and the first and second receiving stations.

14. (Currently amended) A method of synchronizing internal clocks of receiving stations of a locating system, comprising the steps of:

for a first pair of receiving stations A and B in the location system,

transmitting a series of reference data packets from a beacon at a known position;

assuming that the beacon is at the geographical center point between receiving stations A and B;

correlating ~~a~~ first arrival times t_A and second arrival times t_A by plotting times t_A and t_B against each other for the series of reference data packets, where a first arrival time t_A is a time of reception of ~~the~~ a particular reference data packet by the receiving station A, and corresponding second arrival time t_B is a time of reception of the particular reference data packet by the receiving station B,

computing a linear polynomial fit $t_B = m\, t_A + b$, where slope m is function of the difference in the frequencies of the internal clocks of the first and second receiving stations and y-intercept b is the offset due to different start times of the internal clocks of the first and second receiving stations;

determining a bias for the internal clocks using known difference in distance between the beacon and the first and second receiving stations,

synchronizing the internal clocks for the first pair of receiving stations A and B according to the slope m, the offset b and the bias; and

repeating the preceding steps for a second pair of receiving stations in the locating system,

~~comparing an arrival time of the reference data packet at each of a first pair of receiving stations to determine compared arrival time data;~~

~~computing a linear polynomial fit as a function of the compared arrival time data and the arrival times at each of the first pair of receiving stations; and~~

~~synchronizing arrival times of the reference data packet at the first pair of receiving stations as a function of the linear polynomial fit.~~

15. (Cancelled)

16. (Currently amended) The method according to ~~claim 15~~ claim 14, wherein a first one of the receiving stations is included in both the first and second pairs of receiving stations.

17. (Original) The method according to ~~claim 15~~ claim 14, wherein the first pair of receiving stations includes first and second receiving stations and the second pair of receiving stations includes third and fourth receiving stations.